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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Paper No. 15

Application Number: 09/089,698
Filing Date: June 03, 1998
Appellant(s): SPITZ ET AL.

David LaRose
For Appellant

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EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed 06/21/01.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

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(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1-22 and 25-39 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,552,816	Oda et al.	09/1996
4,689,659	Watanabe	08/1987
5,066,964	Fukuda et al.	11/1991

5,426,458	Wenzel et al.	06/1995
5,079,189	Drake et al.	07/1992
5,834,689	Cook	11/1998
4,755,836	Ta et al.	07/1988
5,084,713	Wong	01/1992

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, 5 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (5,552,816) in view of Watanabe (4,689,659).

Oda et al. teaches (Fig. 1) an ink jet cartridge comprising a substrate holder (17) for mounting one of more head tips, having nozzles and heaters (col. 8:32-35). It is the Examiner's position that the head tip is a semi-conductor substrate. If the Applicant contests this position, the Examiner takes Official Notice that it is well known in the ink jet art to provide heaters on a semiconductor substrate. The substrate holder has a top

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surface containing one or more locator wells for accommodating the semi-conductor substrates. Each well has a well base and a plurality of walls. The well base has at least one ink feed slot formed therein. The holder includes one or more chambers (14) on an opposing side of the substrate holder from the locator wells and is in fluid communication with a corresponding locator well. The holder also has side walls formed along a perimeter thereof. An ink reservoir body (11) is attached to the holder. While Oda et al. is silent as to the composition of the heat sink, the Examiner takes Official Notice that it is well known to form a heat sink out of metal.

Oda et al. teaches the claimed invention with the exception of the side walls having fins, a coating of silicon dioxide, and the silicon dioxide having a thickness of between 0.1 to 2.5 microns and the ink reservoir body being integral with the substrate holder.

It is well known in the ink jet art to use a layer of silicon dioxide ink an ink jet print head for the purpose of providing a protective layer. Furthermore, no criticality has been disclosed for the claimed thickness range. Therefore, it would have been obvious to one of ordinary skill in the art to provide a silicon dioxide layer having a thickness of between 0.1 to 2.5 microns for the purpose of providing a protective layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided an ink reservoir integral with the holder, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art (Howard v. Detroit Stove Works, 150 U.S. 164 (1893)).

Watanabe teaches a temperature controller for a semi-conductor device. As can be seen in Fig. 1, the heat sink is provided with integrally formed fins (6A, 6B) for the purpose of increasing the surface area of the heat sink, thereby increasing the rate at which heat is dissipated. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided in Oda et al. a heat sink having integrally formed fins for the purpose of increasing the surface area of the heat sink, thereby increasing the rate at which heat is dissipated as taught to be old by Watanabe.

1. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (5,552,816) in view of Watanabe (4,689,659), as applied to claims 1, 4, 5 and 10-12 above, and further in view of Fukuda et al. (5,066,964).

Oda et al., as modified, teaches the claimed invention with the exception of the substrate holder being made of aluminum.

Fukuda et al. discloses an ink jet print head comprising a heat sink (1) made of aluminum for the purpose of cooling a heat generating substrate (10) (col. 6, lines 10-18). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the heat sink of Oda et al. from aluminum for the purpose of dissipating heat as taught by Fukuda et al.

2. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (5,552,816) in view of Watanabe (4,689,659), as applied to claims 1, 4, 5 and 10-12 above, and further in view of Wenzel et al. (5,426,458).

Oda et al., as modified, teaches the claimed invention with the exception of a polyxylylene coating having a thickness of about 0.1 to 10 microns.

Wenzel et al. discloses an ink jet print head having a coating of polyxylylene with a thickness of between 0.5 and 5 microns for the purpose of forming a corrosion resistant layer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided in Oda et al., as modified, a polyxylylene layer having a thickness of between 0.1 to 10 microns for the purpose of providing corrosion resistance.

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (5,552,816) in view of Watanabe (4,689,659), as applied to claims 1, 4, 5 and 10-12 above, and further in view of Drake et al. (5,079,189).

Oda et al. as modified, discloses the claimed invention with the exception of the substrate holder comprising a material containing carbon fibers or graphite.

Drake et al. discloses a semi-conductor substrate having a heat sink (12.1) made of graphite for the purpose of cooling the substrate (col., 5, lines 16-18).

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Oda et al., as modified, a substrate holder comprising graphite for the purpose of cooling the substrate as taught by Drake et al.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (5,552,816) in view of Watanabe (4,689,659), as applied to claims 1, 4, 5 and 10-12 above, and further in view of Cook (5,834,689).

Oda et al., as modified, discloses the claimed invention with the exception of the substrate holder comprising a metal-ceramic composite.

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Cook discloses a heat sink comprising a composite of a metal matrix and a ceramic for the purpose of improving the thermal conductivity of the heat sink so as to reduce its size.

It would have been recognized in the art of Oda et al. that reducing the size of a heat sink would be desirable so as to reduce the overall size of the print head.

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Oda et al., as modified, a substrate holder comprising a metal-ceramic composite for the purpose improving the thermal conductivity of the substrate holder, so as to reduce the size of the print head.

3. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (5,552,816) in view of Watanabe (4,689,659), as applied to claims 1, 4, 5 and 10-12 above, and further in view of Ta et al. (4,755,836).

Oda et al., as modified, teaches the claimed invention with the exception of one or more carriage positioning devices adjacent one of the side walls.

Ta et al. teaches an ink jet cartridge (Fig. 10) having a plurality of lands (78, 78a, 80, 80a, 82 and 82a) which are positioned adjacent to the side walls of the cartridge for the purpose of aligning the cartridge in the carriage.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided in Oda et al., as modified, carriage positioning devices for the purpose of aligning the cartridge in the carriage as taught by Ta et al.

4. Claims 14, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (4,942,408) in view of Watanabe (4,689,659) and Ta et al. (4,755,836).

Oda et al. teaches (Fig. 1) an ink jet cartridge comprising a substrate carrier (17) for mounting one of more head tips, having nozzles and heaters (col. 8:32-35). It is the Examiner's position that the head tip is a semi-conductor substrate. If the Applicant contests this position, the Examiner takes Official Notice that it is well known in the ink jet art to provide heaters on a semiconductor substrate. The substrate carrier has a top surface containing one or more locator wells for accommodating the semi-conductor substrates. Each well has a well base and a plurality of walls. The well base has at least one ink feed slot formed therein. The carrier includes one or more chambers (14) on an opposing side of the substrate carrier from the locator wells and is in fluid communication with a corresponding locator well. The carrier also has side walls formed along a perimeter thereof. An ink reservoir body (11) is attached to the carrier. While Oda et al. is silent as to the composition of the heat sink, the Examiner takes Official Notice that it is well known to form a heat sink out of metal.

Oda et al. teaches the claimed invention with the exception of the side walls having fins, at least two alignment devices adjacent one of the side walls, a coating of silicon dioxide, the silicon dioxide having a thickness of between 0.1 to 2.5 microns and the ink reservoir body being integral with the substrate holder.

It is well known in the ink jet art to use a layer of silicon dioxide ink an ink jet print head for the purpose of providing a protective layer. Furthermore, no criticality has been disclosed for the claimed thickness range. Therefore, it would have been obvious to one of ordinary skill in the art to provide a silicon dioxide layer having a thickness of between 0.1 to 2.5 microns for the purpose of providing a protective layer.

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Watanabe teaches a temperature controller for a semi-conductor device. As can be seen in Fig. 1, the heat sink is provided with integrally formed fins (6A, 6B) for the purpose of increasing the surface area of the heat sink, thereby increasing the rate at which heat is dissipated. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided in Oda et al. a heat sink having integrally formed fins for the purpose of increasing the surface area of the heat sink, thereby increasing the rate at which heat is dissipated as taught to be old by Watanabe.

Ta et al. teaches an ink jet cartridge (Fig. 10) having a plurality of lands (78, 78a, 80, 80a, 82 and 82a) which are positioned adjacent to the side walls of the cartridge for the purpose of aligning the cartridge in the carriage.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided in Oda et al., as modified, carriage positioning devices for the purpose of aligning the cartridge in the carriage as taught by Ta et al.

5. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (5,552,816) in view of Watanabe (4,689,659) and Ta et al. (4,755,836), as applied to claims 14, 17 and 18, and further in view of Fukuda et al. (5,066,964).

Oda et al., as modified, teaches the claimed invention with the exception of the substrate holder being made of aluminum.

Fukuda et al. discloses an ink jet print head comprising a heat sink (1) made of aluminum for the purpose of cooling a heat generating substrate (10) (col. 6, lines 10-18). It would have been obvious to one of ordinary skill in the art at the time the

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invention was made to have made the heat sink of Oda et al., from aluminum for the purpose of dissipating heat as taught by Fukuda et al.

5. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (5,552,816) in view of Watanabe (4,689,659) and Ta et al. (4,755,836), as applied to claims 14, 17 and 18, and further in view of Wenzel et al. (5,426,458).

Oda et al., as modified, teaches the claimed invention with the exception of a polyxylylene coating having a thickness of about 0.1 to 10 microns.

Wenzel et al. discloses an ink jet print head having a coating of polyxylylene with a thickness of between 0.5 and 5 microns for the purpose of forming a corrosion resistant layer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided in Oda et al., as modified, a polyxylylene layer having a thickness of between 0.1 to 10 microns for the purpose of providing corrosion resistance.

6. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (5,552,816) in view of Watanabe (4,689,659) and Ta et al. (4,755,836), as applied to claims 14, 17 and 18, and further in view of and further in view of Drake et al. (5,079,189).

Oda et al. as modified, discloses the claimed invention with the exception of the substrate holder comprising a material containing carbon fibers or graphite.

Drake et al. discloses a semi-conductor substrate having a heat sink (12.1) made of graphite for the purpose of cooling the substrate (col., 5, lines 16-18).

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Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Oda et al., as modified, a substrate holder comprising graphite for the purpose of cooling the substrate as taught by Drake et al.

7. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (5,552,816) in view of Watanabe (4,689,659), Ta et al. (4,755,836) and , as applied to claims 14, 17 and 18, and further in view of and further in view of Cook (5,834,689).

Oda et al., as modified, discloses the claimed invention with the exception of the substrate holder comprising a metal-ceramic composite.

Cook discloses a heat sink comprising a composite of a metal matrix and a ceramic for the purpose of improving the thermal conductivity of the heat sink so as to reduce its size.

It would have been recognized in the art of Oda et al. that reducing the size of a heat sink would be desirable so as to reduce the overall size of the print head.

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Oda et al., as modified, a substrate holder comprising a metal-ceramic composite for the purpose improving the thermal conductivity of the substrate holder, so as to reduce the size of the print head.

The steps of the method of claims 14-22 are deemed to be rendered obvious in view of the functions of the structure in the combination discussed above.

6. Claims 25-28 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (4,942,408) in view of Ta et al. (4,755,836), Fukuda et al. (5,066,964) and Wong (5,084,713).

Oda et al. teaches (Fig. 1) an ink jet cartridge comprising a substrate carrier (17) for mounting one of more head tips, having nozzles and heaters (col. 8:32-35). It is the Examiner's position that the head tip is a semi-conductor substrate. If the Applicant contests this position, the Examiner takes Official Notice that it is well known in the ink jet art to provide heaters on a semiconductor substrate. The substrate carrier has a top surface containing one or more locator wells for accommodating the semi-conductor substrates. Each well has a well base and a plurality of walls. The well base has at least one ink feed slot formed therein. The carrier includes one or more chambers (14) on an opposing side of the substrate carrier from the locator wells and is in fluid communication with a corresponding locator well. The carrier also has side walls formed along a perimeter thereof. An ink reservoir body (11) is attached to the carrier. While Oda et al. is silent as to the composition of the heat sink, the Examiner takes Official Notice that it is well known to form a heat sink out of metal.

Oda et al. teaches the claimed invention with the exception of the side walls having fins, with the exception of at least two alignment devices and a plurality of slots for attaching the nose piece to the reservoir, a coating of silicon dioxide, the silicon dioxide having a thickness of between 0.1 to 2.5 microns and the ink reservoir body being integral with the substrate holder and the metal being aluminum.

It is well known in the ink jet art to use a layer of silicon dioxide ink an ink jet print head for the purpose of providing a protective layer. Furthermore, no criticality has been disclosed for the claimed thickness range. Therefore, it would have been obvious

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to one of ordinary skill in the art to provide a silicon dioxide layer having a thickness of between 0.1 to 2.5 microns for the purpose of providing a protective layer.

Fukuda et al. discloses an ink jet print head comprising a heat sink (1) made of aluminum for the purpose of cooling a heat generating substrate (10) (col. 6, lines 10-18). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the heat sink of Oda et al., from aluminum for the purpose of dissipating heat as taught by Fukuda et al.

Wong discloses an ink jet print head comprising a substrate support panel (50) having a recess (48) for accommodating and cooling a semi-conductor substrate (12). As can be seen in Fig. 8, the support panel has a top surface and side walls which define a cylindrical first opening (100) which is located opposite the top surface. Plastic alignment pins are provided adjacent the side walls for attaching the panel to holes in a plastic ink cartridge (10) which is positioned adjacent to the support panel. In addition, alignment pins (98) are provided for the purpose of aligning the head to a carriage. It would have been obvious to one of ordinary skill in the art to provide the cylindrical first openings (100) around the perimeters of the side walls and the plastic alignment pins on the support panel, since it has been held that rearranging the parts of an invention involves only routine skill in the art. This would suggest to one of ordinary skill in the art to provide in Oda et al., as modified, slots along the perimeter of the side walls for the purpose of attaching the fluid block to the ink reservoir. Furthermore, it would have been obvious to one of ordinary skill in the art to make the carrier removable from the

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ink reservoir to allow replacement of the ink reservoir with necessitating the replacement of the carrier.

7. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (4,942,408) in view of Ta et al. (4,755,836), Fukuda et al. (5,066,964) and Wong (5,084,713), as applied to claims 25-28 and 31 above, and further in view of Wenzel et al. (5,426,458).

Oda et al., as modified, teaches the claimed invention with the exception of a polyxylylene coating having a thickness of about 0.1 to 10 microns.

Wenzel et al. discloses an ink jet print head having a coating of polyxylylene with a thickness of between 0.5 and 5 microns for the purpose of forming a corrosion resistant layer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided in Oda et al., as modified, a polyxylylene layer having a thickness of between 0.1 to 10 microns for the purpose of providing corrosion resistance.

(11) Response to Argument

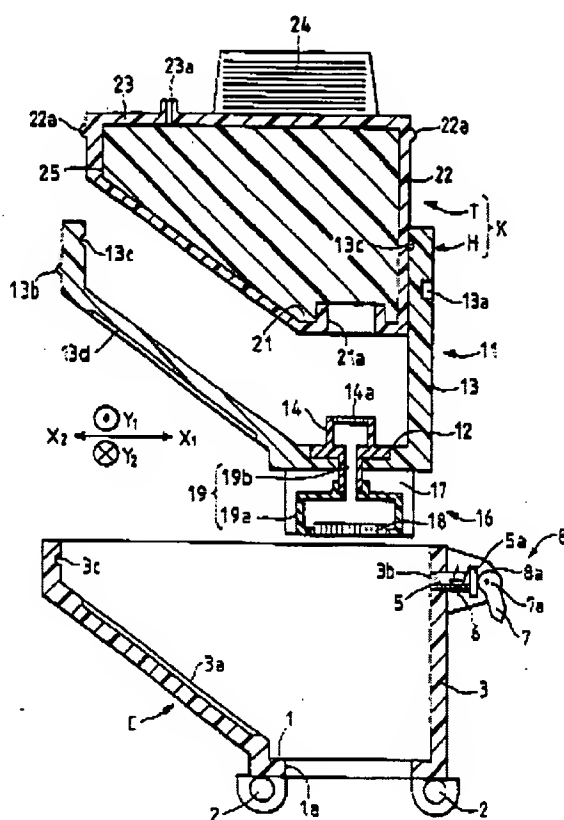
The rejection of claims 32-39 is withdrawn.

Appellant's arguments that there is "absolutely no motivation" to combine the references and that the Examiner has "merely engaged in hind sight reconstruction of Appellant's invention" are not persuasive.

Claims 1, 4-5 and 10-12

Appellant's argument that there is no motivation in Oda et al. ('816) to add fins to the head structure is not persuasive. Oda et al. was not cited to provide such motivation. Oda et al. was cited to teach an ink jet head structure having a substrate holder which functions as a heat sink.

FIG. 1



As can be seen in Fig 1., Oda et al. teaches a heater chip (18) which is contained in a substrate holder (17), which is a heat sink (col. 8:14-25). The motivation for combining references is not supplied by the primary reference, rather it is supplied by

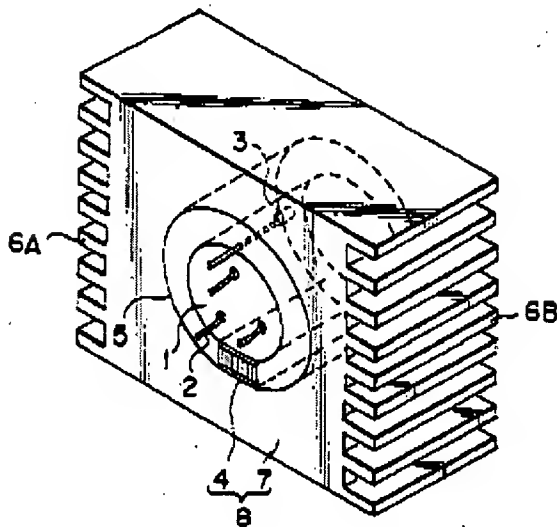
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the teaching or secondary reference. In this case, the motivation to provide fins to the heat sink (17) of Oda et al. is supplied by the teaching reference Watanabe ('659) which will be discussed below.

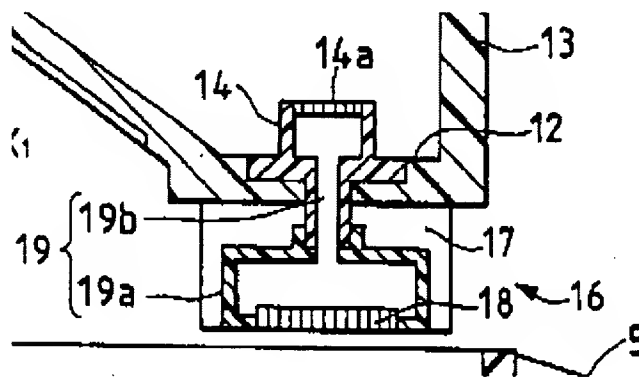
Appellant's further argue that adding fins would defeat the advantages that are provided by Oda et al. ('816). This argument is not persuasive. Oda et al. is directed to reducing a change in pressure of the ink inside the discharge nozzle of the head cartridge (col. 1:7-15). This is accomplished by providing an ink tank having a shape such that a horizontally sectional area of the ink tank increase from the a lower portion to an upper portion thereof (col. 3:17-30). Adding fins to the head (16) as shown in Fig. 1 would not increase the horizontally sectional area of the ink tank (T), as shown in Fig. 1. Additionally, Oda et al. teaches that the "structure of the ink jet recording head (16) per se does not constitute the gist of the present invention. That is, various conventional known structures can be used as the structure..." Since print head may vary considerably in size depending on the number of nozzles and the type of head, Oda et al. suggests that the size of the print head is not of great importance for the operation of the invention taught by Oda et al. Since the size of the head is not of great importance, any increase in size due to the addition of fins would not matter.

Appellant's argue that since Oda et al. ('816) suggests the use of a "conventional head" and that none of the prior art suggests the use of cooling fins, then the suggestion in Oda et al. (816) to use a conventional head does not provide the suggestion to modify the head to include fins. This argument is not persuasive, as the prior art references do suggest cooling fins on one or more the side walls.

FIG. 1



Watanabe ('659) teaches (Fig. 1, above) a temperature controller for a semiconductor device (1). The semiconductor device is contained in a heat sink (7) which is provided with heat radiating fins ((6A and 6B). The fins increase the surface area of the heat sink, and thus improve the efficiency with which the heat generated by the semiconductor device can be radiated into space. The device taught by Oda et al. ('816) is analogous to the device taught by Watanabe. Oda et al. teaches a semiconductor chip (18) that is supported by a heat sink (17). Watanabe teaches a semiconductor device that is supported by a heat sink. It would have been obvious to one of ordinary skill in the art to provide the heat sink of Oda et al. with fins for the purpose of improving the efficiency of the heat sink in dissipating heat generated by the semiconductor chip. Therefore, the prior art of record does provide motivation for modifying Oda et al. ('816) to have cooling fins.



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As can be seen in the enlargement of Fig. 1 of Oda et al. (above), the heater chip (18) is supported by the heat sink and is contained in a locator well. That is, the heat sink has an opening which contains the heater chip. Oda et al. also teaches an ink feed slot (19b) that is formed in the base of the locator well. Oda et al. also teaches a chamber (14) that is formed on an opposing side of the holder. Therefore, all of these features are taught by Oda et al.

Appellant's argument that it is improper to select only the portion of the Watanabe which teaches a heat sink and fins, when the patent calls for the use of a heat sink and fins in combination with a Peltier device and insulation is not persuasive. As the court stated in In re DeLisle, 160 USPQ 806 (CCPA 1969), "[a] reference is to be considered for not only for what it expressly states, but for what it would reasonably have suggested to one of ordinary skill in the art." In this case, Watanabe ('659) would have reasonably suggested the use of fins for the purpose of increasing the heat dissipating efficient of a heat sink. Watanabe is not being cited by the Examiner any purpose other to teach the use of fins on a heat sink.

Appellant's argument there is no motivation to combine the teachings of Watanabe with Oda et al. is not persuasive. As discussed above, Watanabe ('659) teaches (Fig. 1, above) a temperature controller for a semi-conductor device (1). The semi-conductor device is contained in a heat sink (7) which is provided with heat radiating fins ((6A and 6B). The fins increase the surface area of the heat sink, and thus improve the efficiency with which the heat generated by the semi-conductor device can be radiated into space. The device taught by Oda et al. ('816) is analogous to the

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device taught by Watanabe. Oda et al. teaches a semi-conductor chip (18) that is supported by a heat sink (17). Watanabe teaches a semi-conductor device that is supported by a heat sink. It would have been obvious to one of ordinary skill in the art to provide the heat sink of Oda et al. with fins for the purpose of improving the efficiency of the heat sink in dissipating heat generated by the semi-conductor chip. Therefore, the prior art of record does provide motivation for modifying Oda et al. ('816) to have cooling fins.

Appellant's argument that even if the references were properly combinable, the combination would require a heat sink, Peltier cooler and fin which would increase the size of the recording head of Oda et al. is not persuasive. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, Watanabe ('659) is only being used for the teaching a providing fins on a heat sink which contains a semi-conductor device.

Claims 2 and 3

Appellant's argument regarding Oda et al. ('816) and Watanabe ('659) have been addressed above.

Appellant's argument that combining Fukuda et al. ('964) with Oda et al. and Watanabe would require the head of Oda et al. to have a liquid flowing through a liquid

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path in the heat sink and the argument that the cooling device of Watanabe ('659) and the cooling device of Fukuda et al. cannot be combined together are not persuasive.

The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In this case, Fukuda et al is only being used to teach the use of aluminum for making a heat sink.

Claims 6 and 7

Appellant's arguments regarding Oda et al. ('816) and Watanabe ('659) have been addressed above under the heading claims 1, 4, 5 and 10-12.

Appellant's have not provided any arguments directed to Wenzel et al. ('458).

Claim 8

Appellant's arguments regarding Oda et al. ('816) and Watanabe ('659) have been addressed above under the heading claims 1, 4, 5 and 10-12.

Appellant's argument that Drake et al. ('189) is not directed to ink jet print heads is not persuasive. Drake et al. is directed to an ink jet print head (col. 6:14-19 and Fig. 3).

Claim 9

Appellant's arguments regarding Oda et al. ('816) and Watanabe ('659) have been addressed above under the heading claims 1, 4, 5 and 10-12.

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Appellant's argument that Cook ('689) is not directed to ink jet print heads is not persuasive. Cook is directed to a metal-ceramic composite material that is used to manufacture heat sinks. The material provided the advantage of increased thermal conductivity and increased wear resistance (col. 1:18-28). One of ordinary skill in the art would recognize that increasing the thermal conductivity of the heat sink would allow for a reduction in the size of the heat sink. This is desirable because a small heat sink would allow for a reduction in the overall size of the print head. Thus, there is motivation to combine the modify the heat sink of Oda et al. to be made of the composite material of Cook.

Claims 13, 14, 17 and 18

Appellant's arguments regarding Oda et al. ('816) and Watanabe ('659) have been addressed above under the heading claims 1, 4, 5 and 10-12.

Appellant's argument that Ta et al. ('836) does not teach alignment devices adjacent to the side walls of the substrate holder is not persuasive.

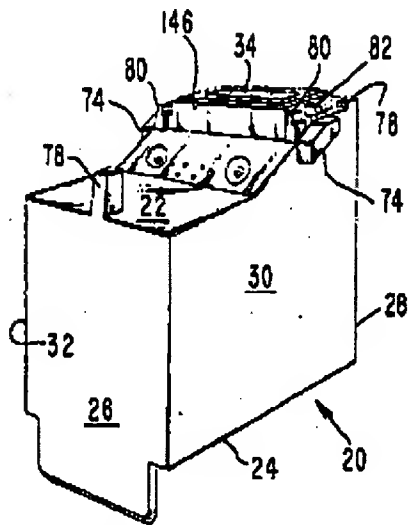


Fig. 10.

Ta et al. teaches (Fig. 10, above) an ink jet cartridge (Fig. 10) having a plurality of lands (78, 78a, 80, 80a, 82 and 82a) which are positioned adjacent to the side walls of the cartridge and the head assembly (34) for the purpose of aligning the cartridge in the carriage. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided in Oda et al., as modified, carriage positioning devices for the purpose of aligning the cartridge in the carriage as taught by Ta et al. Therefore, Ta et al. does meet the claimed limitation.

Claims 15 and 16

Appellant's arguments have been addressed under claims 13, 14, 17 and 18.

Claims 19 and 20

Appellant's arguments have been addressed under heading claims 13, 14, 17 and 18.

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Claim 21

Appellant's arguments have been addressed under claim 8.

Claim 22

Appellant's arguments have been addressed under claim 9.

Claims 25-28 and 31

Appellant's arguments regarding Oda et al. ('816), Ta et al. ('836) and Fukuda et al. ('964) and Watanabe ('659) have been addressed under claims 13, 14, 17 and 18.

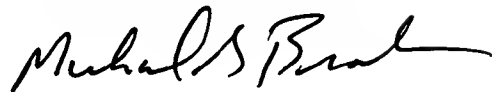
Appellant's argument that Wong et al. does not describe cooling fins on a side wall of the nose piece, an ink feed slot and a chamber are not persuasive, as Wong was not cited to teach these features. Furthermore, Applicant's argument that Wong leads away from the combination of references because it teaches away from a metal heat sink is not persuasive. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, Wong was cited to teach a plurality of slots for attaching the nose piece to an ink reservoir body. Applicant's do not provide any arguments that these features are not taught by Wong.

Claims 25-28 and 31

Appellant's arguments are addressed under claims 25-28 and 31.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

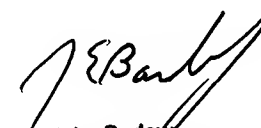


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July 26, 2001

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